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SERVICE INSTRUCTIONS

FOR

MACHINERY INSTALLATION OF SHIP

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PREFACE

The present instruction booklet is a compulsory document to be followed when servicing the machinery installation of the ship.

Besides the present instructions, the service instructions for separate mechanisms, systems and gear should strictly be observed.

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I. DESCRIPTION OF MACHINERY INSTALLATION

A. Application

1. The machinery installation is intended for moving and maneuvering the ship as well as for furnishing the armament, damage control facilities and other ship loads with electric power, steam, water and compressed air.

B. Equipment Set

2. The machinery installation is a three-shaft combined type installation including the following units:

(a) [illegible] diesel engine, driving the controllable pitch [illegible] propeller, with the following associated auxiliaries:

- [illegible] electric oil priming and oil extraction pumps
- oil separator [illegible]
- electric pump [illegible] for pumping water through the diesel engine when the latter is being warmed up;
- coolers, filters, thermostats, air intake and water, oil, fuel, air pressure and exhaust gas pipe lines;
- remote control panel [illegible], metering equipment and warning alarms.

(b) [illegible] gas turbine plants, driving the side fixed blade propellers, [illegible] the associated auxiliaries:

- [illegible] water-gas pumps [illegible],
- oil pump units for lubricating the reducers of the gas turbine plants and thrust bearings of the side shaft lines when maneuvering;

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- coolers, filters, oil, fuel, water and air pipe lines, air intake trunks and gas ducts;
- purifiers [illegible] with attached auxiliaries;
- control panels and metering equipment.

(c) - Controllable pitch propeller with the pitch control gear, with the attached mechanisms, equipment and pipe lines.

(d) Electric remote control system for the main engines and controllable pitch propeller and emergency remote hand controls for the gas turbine plants.

(e) Auxiliary steam boiler [illegible] with the attached mechanisms, equipment and pipe lines.

(f) Three electric compressors [illegible] with the attached equipment, pipe lines and air bottles.

(g) Electric fuel transfer pump [illegible].

(h) Fuel separator [illegible].

(i) Four electric fire pumps [illegible].

(j) Electric sanitary pumps [illegible] and [illegible].

(k) Three electric bilge pumps [illegible].

2. The electrical installation of the ship consists of the following units:

(a) Power power plant including:

- diesel-generator set No.1 of [illegible] mark with the attached heat exchangers, equipment and pipe lines;
- main distribution switchboard No.1 with the attached equipment and electric power distribution system.

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(b) Aft power plant including:

- diesel-generator set No.2 of [illegible] mark and diesel-generator set No.3 of [illegible] mark with the attached heat exchangers, equipment and pipe lines;
- main distribution switchboard No.2 with the attached equipment and electric power distribution system.

C. Arrangement

(See diagram No.1)

4. The machinery installation is arranged in two engine rooms, stabilisers room and pitch control gear room. The fore engine room is located in way of frames 56-57, the aft engine room, in way of frames 81-96, the stabilisers room, in way of frames 71-81, the pitch control gear room, in way of frames 96-108.

5. Arranged in the special soundproof recess in the stabilisers room is a manoeuvering station which serves as the main control and damage control station.

6. Located in the special soundproof recess in the fore engine room is a secondary control station of the gas turbine plants.

D. Control System

(See diagrams Nos.2 and 3)

7. The ship is equipped with the following control systems for the machinery installation:

- manoeuvering station;
- secondary control station of the gas turbine plants;

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- main diesel engine stand-by control station located in the aft engine room;
- controllable pitch propeller emergency control station located in the pitch control gear room.

8. The manoeuvering station houses the following units:

- electric remote control panel;
- main diesel engine pneumatic remote control panel;
- instrument panel of the main diesel engine, gas turbine plants and controllable pitch propeller;
- tachometer of the diesel engine;
- control panels of the gas turbine plants;
- remote pitch indicator of the controllable pitch propeller;
- receivers-transmitters of the engine-room telegraph;
- loudspeaker system switch;
- power switch of the electric remote control system;
- reducing valve of the main engine thermoregulating and remote control system;
- compressed air starting valve drive handwheel of the main diesel engine;
- main start emergency-air discharge valve handwheel of the main diesel engine;
- the handwheels of the valve drives of compressed air supply to the crossovers of the gas turbine plants;
- instrument panel of diesel-generator sets Nos.2 and 3;
- start and stop buttons for the following units: electric oil priming, oil extraction and fire pumps installed in the aft engine room and stabilisers rooms, bilvage pumps installed in the aft engine room and air

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conditioner room;

remote control amplidyne;

pitch control gear pump;

oil pump sets for lubricating the reducers of the gas turbine plants when reversing and thrust bearings of the side shaft lines;

rectifiers [illegible],

- flooding board;

- other auxiliary instruments and equipment.

9. Installed in the secondary control station are the following devices:

- engine-room telegraph switch;

- instrument panel of the gas turbine plants;

- emergency remote control heads of the gas turbine plants as well as the device for shifting from electric to emergency remote control and vice versa and gas turbine plant servomotors of the electric remote control system;

- control panels of the gas turbine plants;

- remote pitch indicator of the controllable pitch propeller;

- instrument panel of diesel-generator set No.1;

- remote speed governor heads of diesel-generator set No.1;

- main distribution switchboard feed of the fore power plant and feed circuit breakers of the side rudders circuit;

- four cylinders of the gas turbine plant liquid fire-fighting system fitted with a [illegible] drive;

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- two valve drives of the fire system intended for sprinkling the bottom part of the thermal insulation jackets of the gas turbine plant exhaust gas pipes;
- start and stop buttons of the electric fire and salvage pumps installed in the fore engine room.

10. An electric remote control system is installed in the ship for controlling the main engines and controllable pitch propeller from a distance. This system is a basic control means.

The system provides for separate control of the gas turbine plants and main diesel engine together with the controllable pitch propeller from the maneuvering room.

The control from the maneuvering room complies with the telegraph orders sent from the pilot house or navigating bridge.

11. Panel [illegible] and the local control station located directly on the diesel engine serve as main diesel engine stand-by control means. The manual control device located in the pitch control gear room serves as a stand-by control means for the controllable pitch propeller.

The main diesel engine is started and stopped either from panel [illegible] or from the diesel engine stand-by control station.

When controlling the main diesel engine by means of the electric remote control system, starting the diesel engine is accomplished from panel [illegible] and then the control is shifted to the electric remote control panel.

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CAUTION! THE FIRST STARTS OF THE MAIN DIESEL ENGINE DURING EVERY DAY SERVICE AS WELL AS AFTER A PROLONGED IDLENESS AND REPAIR ARE EFFECTED ONLY FROM THE STAND-BY CONTROL STATION LOCATED ON THE DIESEL ENGINE

The directions for shifting control of the main diesel engine from one to the other station are given in the main diesel engine service instruction booklet.

12. Stand-by control of the gas turbine plants is furnished by a manual shaft-lever remote control system mounted in the [illegible] control station.

The gas turbine plants are started and shut down by pressing the "start" and "stop" buttons on the control panels.

The gas turbine plant starting system provides for starting the plant automatically from a distance and working it up to the idle speed.

The directions for shifting control of the gas turbine plants from the electric remote to stand-by control system are given in the service instruction booklet for the gas turbine plant remote controls.

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II. PREPARING FOR OPERATION

13. The machinery installation may be prepared for operation in normal and emergency manners.

14. The normal and emergency preparations are effected by the personnel of the engine-room division under the supervision of the chief engineer in accordance with the bill for preparing the ship for getting under way and in accordance with the standing service instructions for mechanisms and systems.

15. Starting the main diesel engine and gas turbine plants may be done only on receiving a permission from the ship's control centre.

A. Normal preparation

16. This preparation is started on receiving a general ship order or a signal of preparing the ship for getting under way. The order should be given in advance with regard for the period of time required for preparing the machinery installation.

17. The order and priority recommended for normal preparations of the machinery installation are listed in the plan given below (see sheets 14-15).

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B. Emergency Preparation

18. This preparation is started on receiving the corresponding orders and signals.

19. When preparing the installation in an emergency manner, the corresponding service instructions for the main and auxiliary mechanisms should be followed.

The recommended order and priority of putting the installation in operation are given in the plan below (see sheets 18,19).

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III. CONTROLLING AND SERVICING MACHINERY INSTALLATION

20. The ship is provided with the following means for controlling the machinery installation:

- Electric remote control system providing separate control of the gas turbine plants, main diesel engine and controllable pitch propeller from the manoeuvering room.
- Pneumatic remote control system providing control of the main diesel engine by means of panel [illegible] installed in the manoeuvering room.
- Main diesel engine stand-by control system providing control from the station in the aft engine room by means of the control handle installed on the diesel engine.
- Stand-by remote control of the gas turbine plants from the secondary control station.
- Controllable pitch propeller local control system providing control from the pitch control gear room by means of the control unit lever on the pitch control gear.
- Controllable pitch propeller emergency control system providing for setting the propeller blades to the fixed position by means of the forcing bolts of the pitch control gear piston. The control is effected from the pitch control gear room.

Should some of the control systems fail, the control and communication should be effected in the sequence given below by means of:

- engine room telegraphs;
- engine room loudspeaker system;
- ship-control line;

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- annunciator system;
- all manic bells;
- speaking tubes;
- runners.

Changing over from one to the other communication system may be done only at the order from the ship's control centre.

21. During the operation of the machinery installation at least once every hour inspect the main and auxiliary machinery and associated pipe lines.

1. Control when Ship is under Way

Running with main diesel engine operating and control effected by electric remote control system

22. The preset speed, within the range of "Diesel engine ahead top speed"to "Astern full speed" is achieved by shifting the centre handle on the electric remote control panel.

In this case the diesel engine speed and the controllable pitch propeller blade position are automatically set to correspond to the prescribed duty.

CAUTION! TO AVOID OVERLOAD OF THE DIESEL ENGINE IT IS PROHIBITED TO MOVE THE CENTRE HANDLE BEYOND THE POSITION "DIESEL ENGINE AHEAD TOP SPEED" WHEN THE SHIP IS GOING AHEAD ONLY ON THE MAIN DIESEL ENGINE

23. Table No.1 given below shows the duties of the main diesel engine and controllable pitch propeller with respect to the engine room telegraph commands.

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Table No.1

(running on load test)

Item No.		Engine room telegraph position	[illegible]		Indications on remote pitch indicator
			Main engine shafting	Main engine shafting	
1		2	3	4	5
1	Ahead	Top speed	3[illegible]	6[illegible]	[illegible]
2	Ahead	Full speed	[illegible]	[illegible]	[illegible]
3	Ahead	Half speed	[illegible]	[illegible]	[illegible]
4	Ahead	Slow speed	[illegible]	[illegible]	[illegible]
5		Stop		[illegible]	
6		Stand by			
7	Astern	Slow speed			[illegible]
8	Astern	Half speed	[illegible]		[illegible]
9	Astern	Full speed			[illegible]

Notes: 1. The [illegible] given in table 3, [illegible] exactly after [illegible].

2. The operation of the [illegible] speed and [illegible] the ordinary [illegible]

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To return the correction devices to the normal position, press the correction stop button on the control panel.

When the controllable pitch propeller blades pass the "Stop" position, the correction is automatically stopped.

Running with three engine operating and control effected by electric remote control system

27. Table No.2 given below shows the duties of the main diesel engine, gas turbine plants and controllable pitch propeller with respect to the engine room telegraph commands.

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Table No.2

...nning on Three Engines

Item No.	Engine room telegraph			S.H.P. (approx.)				Indications on remote pitch indicator
	Diesel engine	Gas turbine plants		...speed ...	...diesel engine ...	...	High pressure compressors of gas turbine plants	
1	2		3	4				5
1	Ahead	Top speed	...	...	...	...	...	...
2		Top speed	... by	...	...	...	...	...
3		Full speed	Slow speed	325	79	22	52 % warm-up fail	...
4		Top speed	Slow speed	3[illegible]	[illegible]	24	[illegible]	
5		Top speed	Half speed	350	850	[illegible]	[illegible]	
6		Top speed	Full speed	350	[illegible]	40	[illegible]	
7		Top speed	Top speed	350	850	[illegible] 550	Maximum r.p.m. depending on the prevailing air temperature	

NOTES: 1. The correlations between the [illegible] in table No.2 are valid for the normal [illegible] termed conditions, that is, when the ship's displacement is about normal and sea forces do not exceed three points. They are to be exactly determined after the trials of the type ship.

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[redacted]

values at an air temperature of [redacted]
and the relation between the [redacted]
-propeller compressor speed and the
ambient air temperature will be
given in the service lists for
the gas turbine plants.
At an air temperature exceeding
+25°C the propeller speeds will
differ from those indicated in
table No.2 and at a temperature
+32°C the rated speed will amount
to 510 r.p.m.

3. The values for the remote pitch
indicator given in table No.1 are
to be exactly determined for each
ship after the trials.
4. The duty "Three engines ahead top
speed" corresponds to the top
speed of the ship

20. The preset speed within the range of "Diesel engine ahead top speed" to "Three engines ahead top speed" is obtained as follows:

(a) When the speed is increased, set the side handles to the preset position complying with the high-pressure compressor speed and, as the side engines reach the preset speed, shift the centre handle of the [redacted] remote control panel to the preset position.
When increasing the speed up to "Three engines ahead full speed" and up to "Three engines ahead top speed", shift the centre handle of the panel to the preset position as soon as the side shaft lines reach 4[redacted] r.p.m.

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(b) when decreasing the speed, shift the side handles of the panel to the present positions and then (without delay) shift the centre handle to the corresponding position.

When changing over from "Three engines ahead top speed" to "Diesel engine ahead top speed", stop or leave in operation at "Idle speed" the gas turbine plants depending on the subsequent running duties.

29. Changing over from any speed ahead on three engines to any speed astern should be accomplished in the following order:

(a) Shift the side handles of the panel to "Idle speed" and the centre handle to "Stop".

(b) After the speed of the high-pressure compressors of the gas turbine plants has dropped to 5200 r.p.m. and the pointers of the remote pitch indicator have come to "Stop", move the centre handle to the preset position.

CAUTION! RUNNING ASTERN MAY BE EFFECTED ONLY WITH THE GAS TURBINE PLANTS SHUT DOWN

When reversing, the gas turbine plants may be operated at "Idle speed" for not more than 5 minutes, the temperature of the gases after the high-pressure turbine being not in excess of +520°C.

30. The speed of the side shafts alone may be decreased to 100 r.p.m. with the high-pressure compressors operating at full speed (when turning in a circle) for no longer

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Item 5 continued.

Control of Ship Running in Case of Failure of Electric Remote Control System

11. Should the electric remote control system fail, transmitting commands from the pilot house or navigating bridge to the manoeuvering room is continued through the engine room telegraph. A command is sent to the stations of the machinery division to shift to manual control of the machinery installation.

Running control should be effected for each engine separately from the manoeuvering room.

In this case proceed as follows:

- Cut out (deenergize) the electric remote control system.
- Control the main diesel engine from panel DU7-4 from the manoeuvering room or, having disconnected panel DU7-4, from the stand-by station.
- Control the controllable pitch propeller from the pitch control gear room.
- Control the gas turbine plants from the secondary control station.

WARNING! WHEN MANUAL CONTROL IS APPLIED TO, IT IS NECESSARY TO ENSURE PROPER COMMUNICATION BETWEEN THE MANOEUVERING ROOM AND THE STATION EXERCISING MANUAL CONTROL OF THE MAIN DIESEL ENGINE, GAS TURBINE PLANTS AND CONTROLLABLE PITCH PROPELLER IN ORDER TO PREVENT CARRYING OUT THE ORDERS CONCERNING THE SHIP'S SPEEDS INCORRECTLY.

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(a) Running on main diesel engine

32. To obtain the preset speed make use of table No.1 of the present instruction booklet.

When controlling the speed (when the positions of the controllable pitch propeller blades and the diesel engine speed are changed simultaneously) follow the following rule: pitch should always be changed at the lower diesel engine speed, that is, if the telegraph order is received to increase the diesel engine speed, it is necessary first to shift the blades to the preset position and then to increase the diesel engine speed; if the telegraph order is received to decrease the diesel engine speed, it is necessary first to decrease the speed and then to shift the blades to the preset position.

(b) Running on three engines

33. To obtain the preset speed make use of table No.2 of the present instruction booklet.

34. The required speed within the range from "Diesel engine ahead top speed" to "Three engines ahead top speed" should be obtained in the following order:

- When increasing the speed, first bring the side propellers to the required speed and then shift the controllable pitch propeller blades to the preset position.
- To obtain "Three engines ahead top speed", as soon as the side shaft lines reach 400 r.p.m., shift the controllable pitch propeller blades to the position corresponding to "Three engines ahead top speed" as per the remote pitch indicator and then work up the side shaft lines

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to the full speed.

- When decreasing the speed, set the required speed of the side shaft lines and then shift the controllable pitch propeller blades to the preset position.

35. When changing over from "Three engines ahead top speed" to "Diesel engine ahead top speed", proceed as follows:

- Bring the side propellers speed down to 270 r.p.m.
- Shift the controllable pitch propeller blades to the position (as per the remote pitch indicator) corresponding to "Diesel engine ahead top speed".
- Switch over the side engines to "Idle speed" or shut them down (if necessary).

(c) Reversing when running on main diesel engine

36. To ensure reversal from "Diesel engine ahead top speed" to "Astern full speed" and vice versa proceed as follows:

- Bring the shaft line speed down to [illegible] r.p.m..
- Shift the controllable pitch propeller blades to the "Astern full speed" position.
- Bring the main diesel engine speed to the required value.

(d) Reversing when running on three engines

To ensure reversing when running on three engines, proceed as follows:

- Switch over the side engines to "Idle speed".
- Decrease the centre shaft line speed to [illegible] r.p.m.
- When bringing the speed of the high-pressure compressors of the side engines down to 5[illegible] r.p.m., shift the controllable pitch propeller blades to "Astern full speed" ... .

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if necessary, increase the diesel engine speed.

WARNING! WHEN REVERSING DURING RUNNING OF THREE ENGINES, THE SIDE ENGINES MAY BE OPERATED AT "IDLE SPEED" FOR NOT MORE THAN 5 MINUTES AT A TEMPERATURE AFTER THE HIGH-PRESSURE TURBINE NOT EXCEEDING +520°C.

B. Special Operating Duties of Machinery Installation

38. When the ship is running on the main diesel engine and the conditions of navigation require that the present speed is maintained at which the diesel engine gets overloaded (e.g. when towing, when one or two side shaft lines are stopped), it is necessary to shift to separate control of the diesel engine and the controllable pitch propeller and, gradually decreasing the pitch of the controllable pitch propeller and increasing the diesel engine speed, to change over to another duty which will allow to pick up greater power at the ratio between the speed and the pitch of the controllable pitch propeller which differs from that shown in table No.1.Practically, in this manner the main diesel engine may be loaded up to the full power at all speeds in all the cases when the resistance to the ship motion changes. It is necessary to prevent exhaust gas temperature from rising above the limit values as per the load characteristic given in the service instructions for the main diesel engine.

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39. If the control system gets damaged or the controllable pitch propeller blades jammed in various positions, it should be borne in mind that, if the blades remain in the position corresponding to the full diesel engine speed, as per the remote pitch indicator, then the main diesel engine may be operated at all speeds as with the fixed pitch propeller. If the controllable pitch propeller blades remain in the position corresponding to the top speed on three engines as per the remote pitch indicator, then running on the diesel engine alone may be safe only when its speed is kept as low as 420 r.p.m. as at a higher speed the main diesel engine will be overloaded.

To increase the speed, the gas turbine plants should be started. Depending on the preset speed first set the required speed of the gas turbine plants and, as the ship's speed increases, increase the speed of the main diesel engine seeing that the diesel engine exhaust gas temperature does not exceed the allowable value.

40. Should the main diesel engine or the centre shaft line become inoperative, the ship may be propelled continuously by the gas turbine plants.

41. To decrease the resistance of the centre propeller when running continuously on the gas turbine plants, brake the centre shaft line and set the controllable pitch propeller blades to the maximum pitch ahead position as per the remote pitch indicator scale.

In this case the permissible speed of the gas propellers is limited by the holding power of the shaft line brake which is designed for holding the shaft line at a speed up to 14 knots

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WARNING! IT SHOULD ALWAYS BE KEPT IN MIND THAT NO REVERSAL MAY BE DONE WHEN THE SHIP IS PROPELLED BY THE GAS TURBINE PLANTS

42. Should the main diesel engine and one of the gas turbine plants become inoperative, the ship may be propelled by the other gas turbine plant. In this case the centre shaft line should be braked and the non-operating side shaft line, locked (if it is inoperative) or it may autorotate.

When the ship is propelled by one gas turbine plant and the other side shaft line is locked, the ship's speed is limited by the holding power of the locking device which is designed for a speed up to 13 knots. To decrease the resistance of the centre propeller, set the controllable pitch propeller blades to the maximum pitch ahead position as per the remote pitch indicator scale, the centre shaft line being braked.

43. When the ship is propelled by three engines and the gas turbine plants suddenly stop to operate, shift the controllable pitch propeller to the duty of running on the diesel engine in order to avoid overloading of the latter.

44. Should one or both of the side shaft lines become inoperative, lock the damaged shaft lines. Recommendations for running on the diesel engine with side shaft lines locked are listed under item 38.

The permissible ship's speeds are limited by the holding power of the reducer locking device which is designed for holding the shaft line at a speed up to 13 knots.

45. When the main diesel engine is cooled by the HUB-160/10 pump in an emergency, the diesel engine may be operated at 600 r.p.m.

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46. In [illegible] loss of power occurs in the electric remote control system the control of the engine plant by means of this system may be effected only after it is newly energized.

CAUTION! SHIFTING THE CONTROL HANDLES ON THE ELECTRIC REMOTE CONTROL PANEL AFTER DEENERGIZING TILL RE-ENERGIZING IS PROHIBITED

NOTE: It should be kept in mind that if the electric remote control system gets deenergized when the main engines are operating, the servomotors of the system maintain the operation of the main engines at the speeds obtained before deenergizing.

47. Recommendations for eliminating troubles which may occur in the separate mechanisms, devices and pipe lines of the machinery installation are given in the service instructions for these mechanisms, devices, systems and pipe lines.

C. Sailing under Hard Navigation Conditions

48. When sailing under hard navigation conditions (in narrow channels, fog, etc.) maintain the machinery installation in very good condition.

49. Maintain the gas turbine plants always ready for immediate starting. All the diesel-generator sets and fire pumps should be in operation.

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The side rudders should be in operation or prepared for immediate operation.

50. Particular attention should be paid to the preparedness for immediate operation of the damage control system. The mail should be made watertight, all the watertight hatches, doorways and lights should be dogged. If necessary, ballast and right the ship in accordance with the instructions for maintaining stability and safety of the ship.

51. If the sea force exceeds 3 points, the exhaust gas flaps should be shut as soon as the main diesel engine and diesel-generator sets are shut down.

The flaps should be opened shortly before starting the diesel engines.

52. When moving in a disturbed sea in order to decrease rolling put the ship stabilizers in operation in accordance with their service instructions.

53. Under ice conditions the ship may sail only in crushed ice with a speed not exceeding 7-8 knots.

To detect clogging of the sea valves in due time, carefully observe the oil and water temperature at the inlet and outlet of the main dieselengine. If necessary, blow out the sea valves with steam.

54. The ship may be towed with the bow or stern ahead. The towing speed for the ships of this type depends on the towing gear strength and should not exceed 10 knots at the sea force not exceeding 3 points.

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8. Prolonged Idleness and Repairs

55. Keep clean the main and auxiliary mechanisms, gear, devices, systems, pipe lines, equipment and spaces. Do not let water, fuel and oil accumulate in the holds.

Care of all the mechanisms, gear, devices and pipe lines should comply with the corresponding service instructions.

56. To prevent corrosion during prolonged idleness, the main and auxiliary engines, auxiliary steam boiler, auxiliary mechanisms, devices, shaft lines, systems, pipe lines, gear and equipment should be preserved.

57. Preventive inspections and repairs should be made in compliance with the corresponding sections of the service instructions for the main and auxiliary engines, mechanisms, devices, gear, electrical equipment, thermal control instruments and of the service instructions for hull pipe lines, gear and systems.

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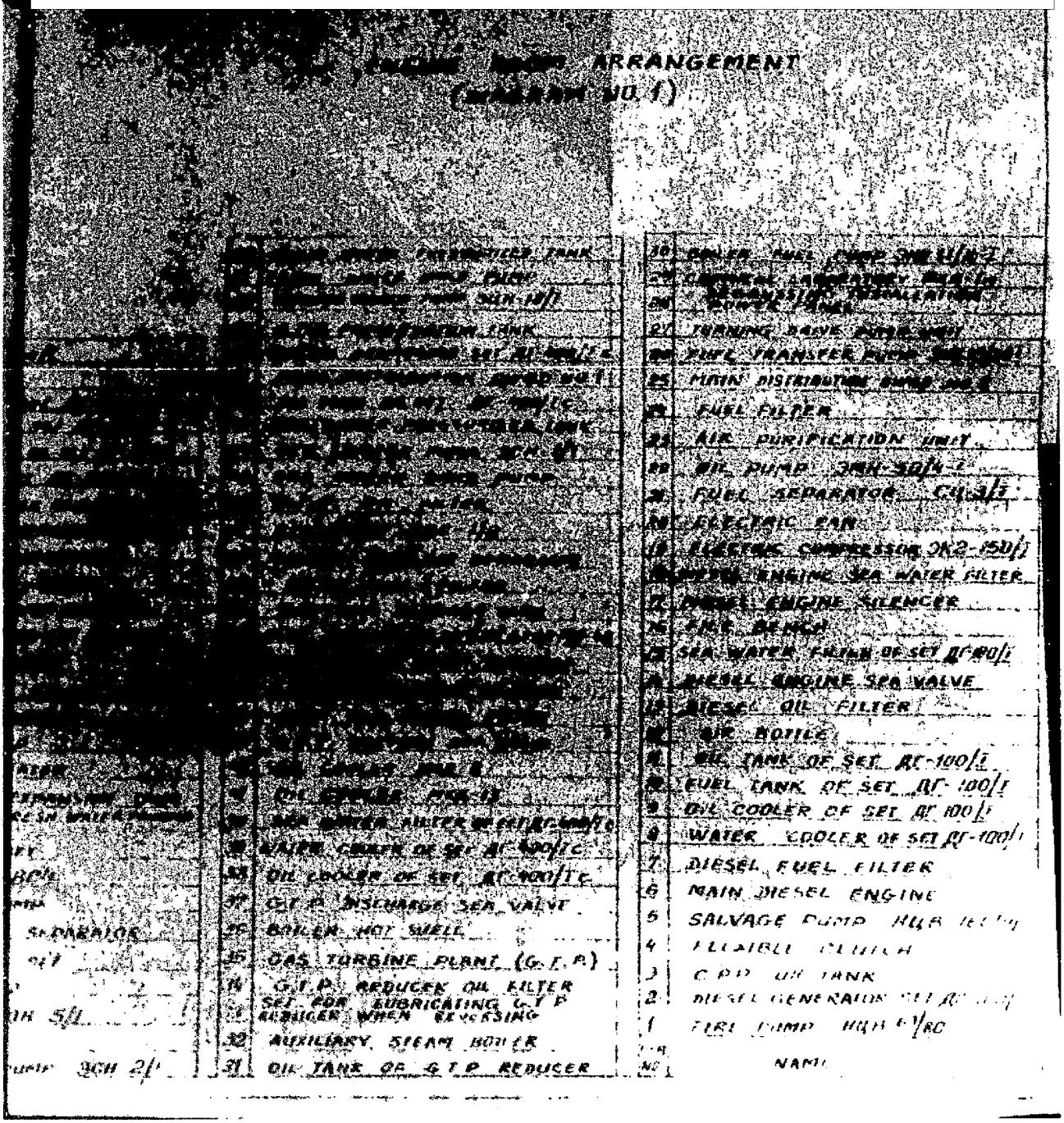
ARRANGEMENT
VO 1)
31 OIL TANK OF G.T.P. REDUCER
32 AUXILIARY STEAM BOILER
33 G.T.P. REDUCER OIL FILTER SET FOR LUBRICATING G.T.P. REDUCER WHEN REVERSING
35 GAS TURBINE PLANT (G.T.P.)
36 BOILER HOT WELL
37 G.T.P. DISCHARGE SEA VALVE
38 OIL COOLER OF SET AT-100/1 C
39 WATER COOLER OF SET AT-100/1 C
40 MAIN CONDENSER
41 G.T.P. REDUCER
42 OIL SEPARATOR
43 FRESH WATER PURIFIER TANK
1 FUEL PUMP HUM 6 1/80
2 DIESEL GENERATOR SET AT-100/1
3 CFO OIL TANK
4 FLEXIBLE COUPLING
5 SALVAGE PUMP
6 MAIN DIESEL ENGINE
7 DIESEL FUEL FILTER
8 WATER COOLER OF SET AT-100/1
9 OIL COOLER OF SET AT-100/1
10 FUEL TANK OF SET AT-100/1
11 OIL TANK OF SET AT-100/1
12 OIL BOTTLE
13 DIESEL OIL FILTER
14 DIESEL ENGINE SEA VALVE
15 SEA WATER FILTER OF SET AT-100/1
16 DIESEL ENGINE SILENCER
17 AIR BENCH
18 ELECTRIC COMPRESSOR 2K2-150/1
19 DIESEL ENGINE SEA WATER FILTER
20 ELECTRIC COMPRESSOR 2K2-150/1
21 AIR PURIFICATION UNIT
22 FUEL SEPARATOR
23 FUEL FILTER
24 MAIN DISTRIBUTION BOARD
25 FUEL TRANSFER PUMP
26 TURNING GEAR MOTOR
27 BOILER FEED PUMP
NO. NAME

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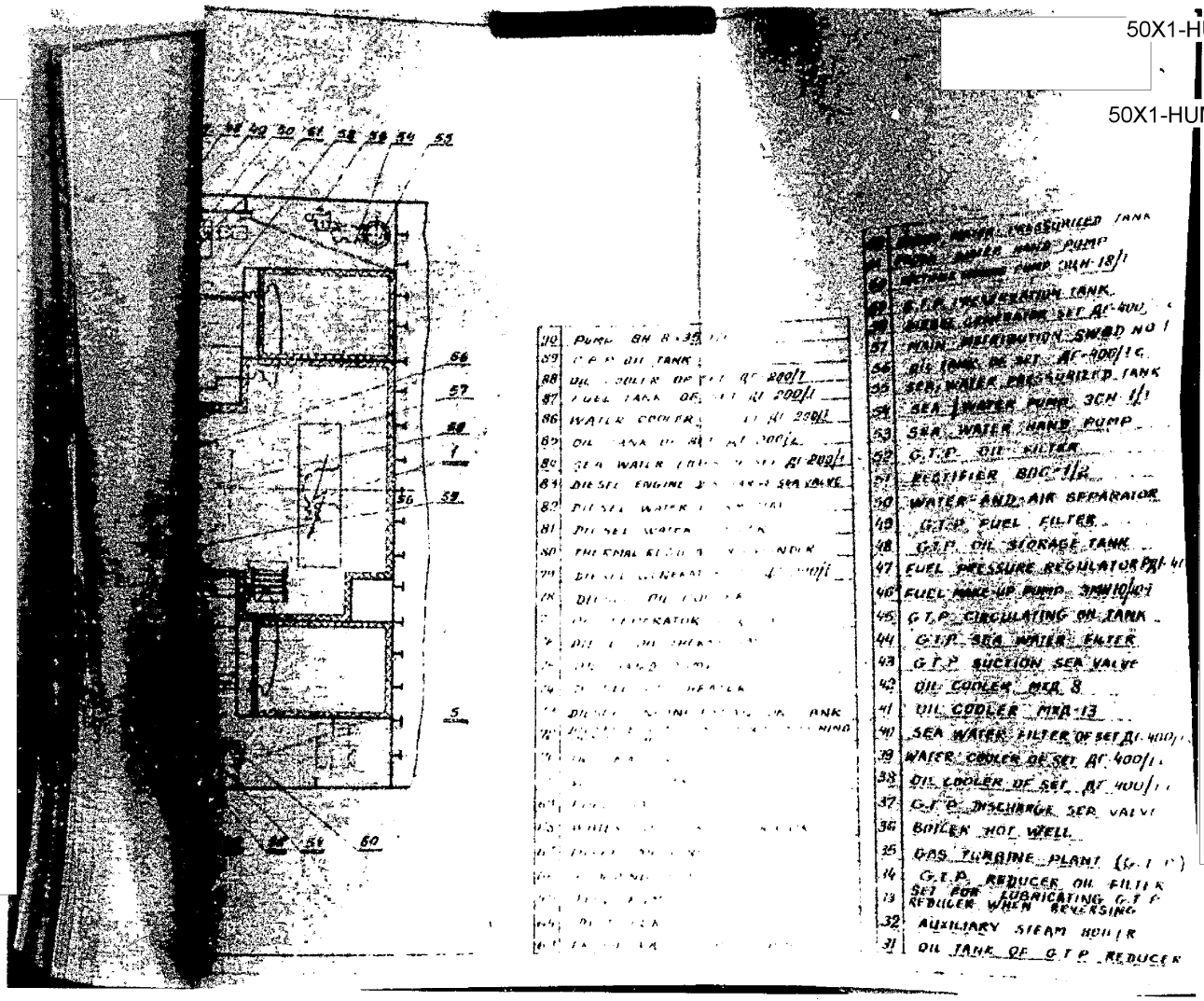
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PUMP SH R-35
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OIL COOLER OF SET AT 200/1
FUEL TANK OF SET AT 200/1
WATER COOLER SET AT 200/1
OIL TANK OF SET AT 200/1
SEA WATER SET AT 200/1
DIESEL ENGINE SEA VALVE
DIESEL WATER
DIESEL WATER
THERMAL
DIESEL GENERAT
DIESEL OIL
OIL PURIFICATOR
DIESEL OIL
OIL
DIESEL HEATER
DIESEL TANK
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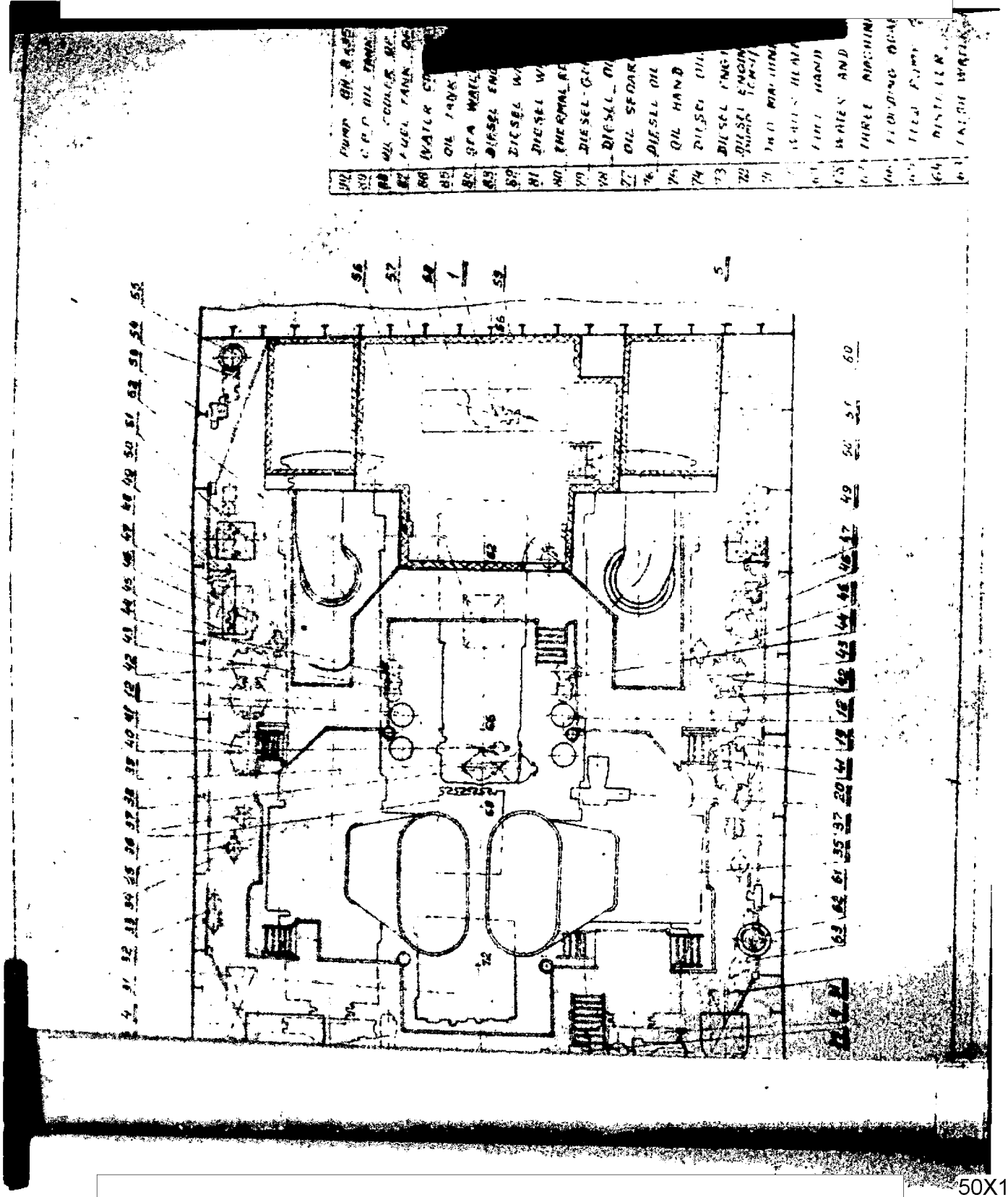

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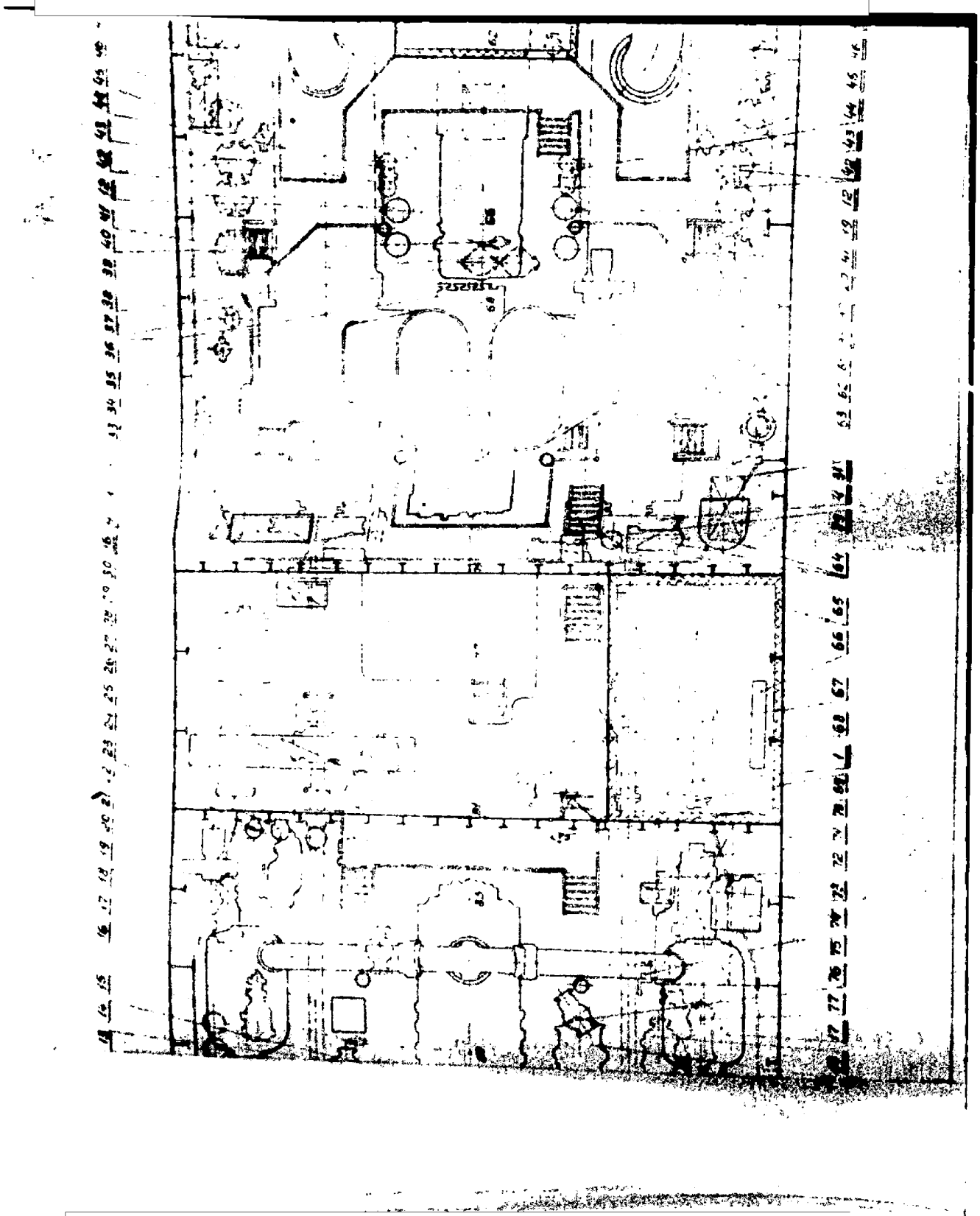

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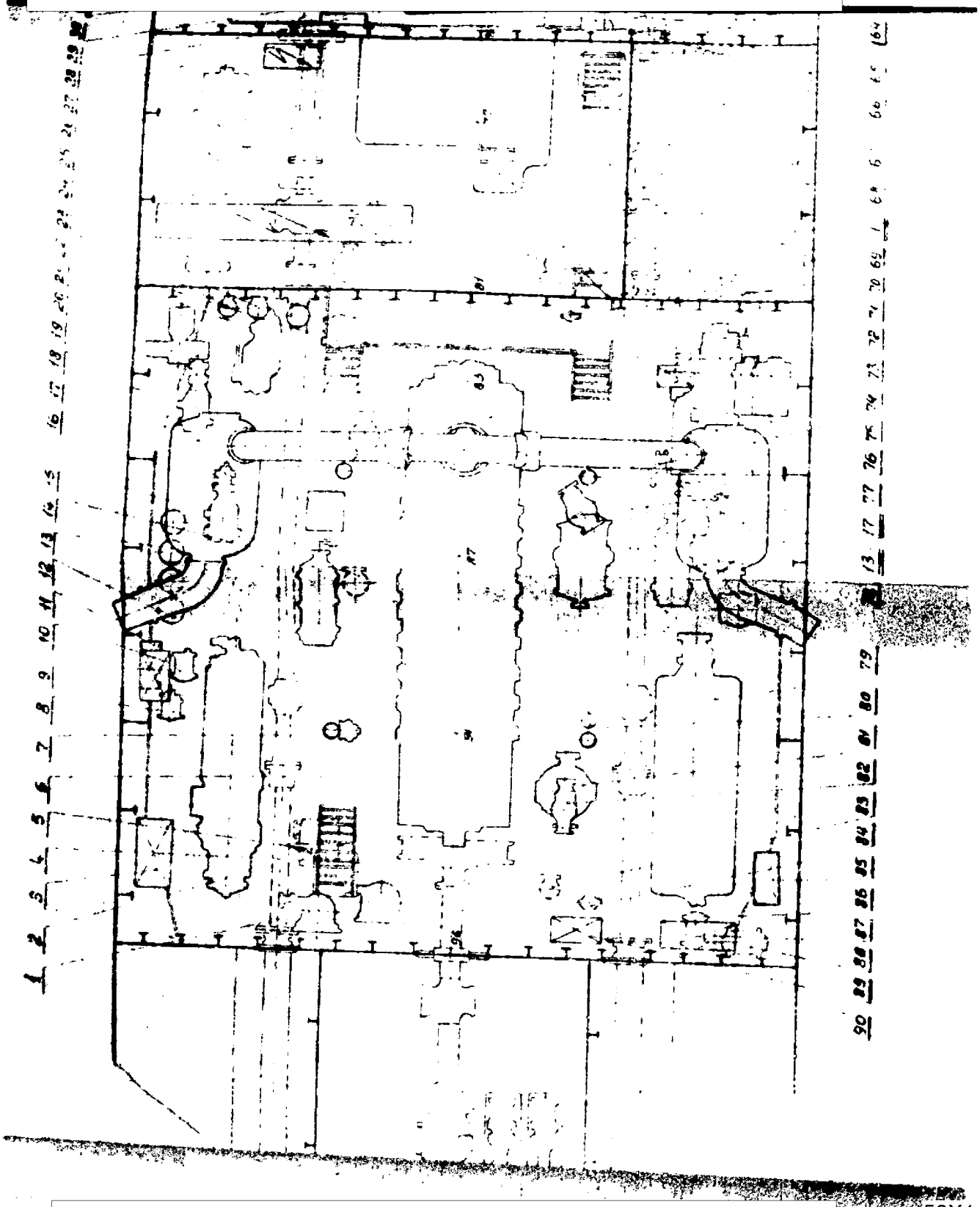

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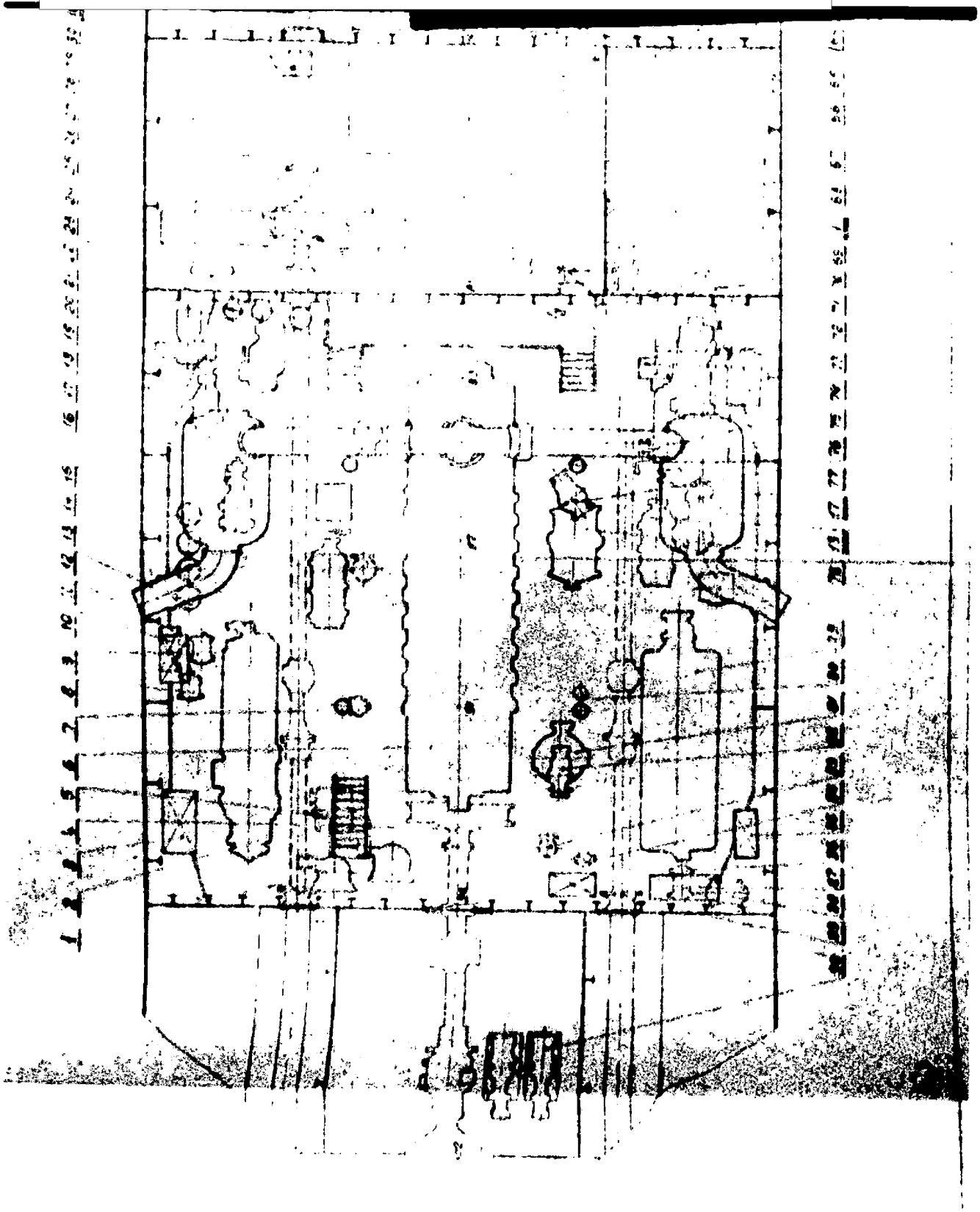

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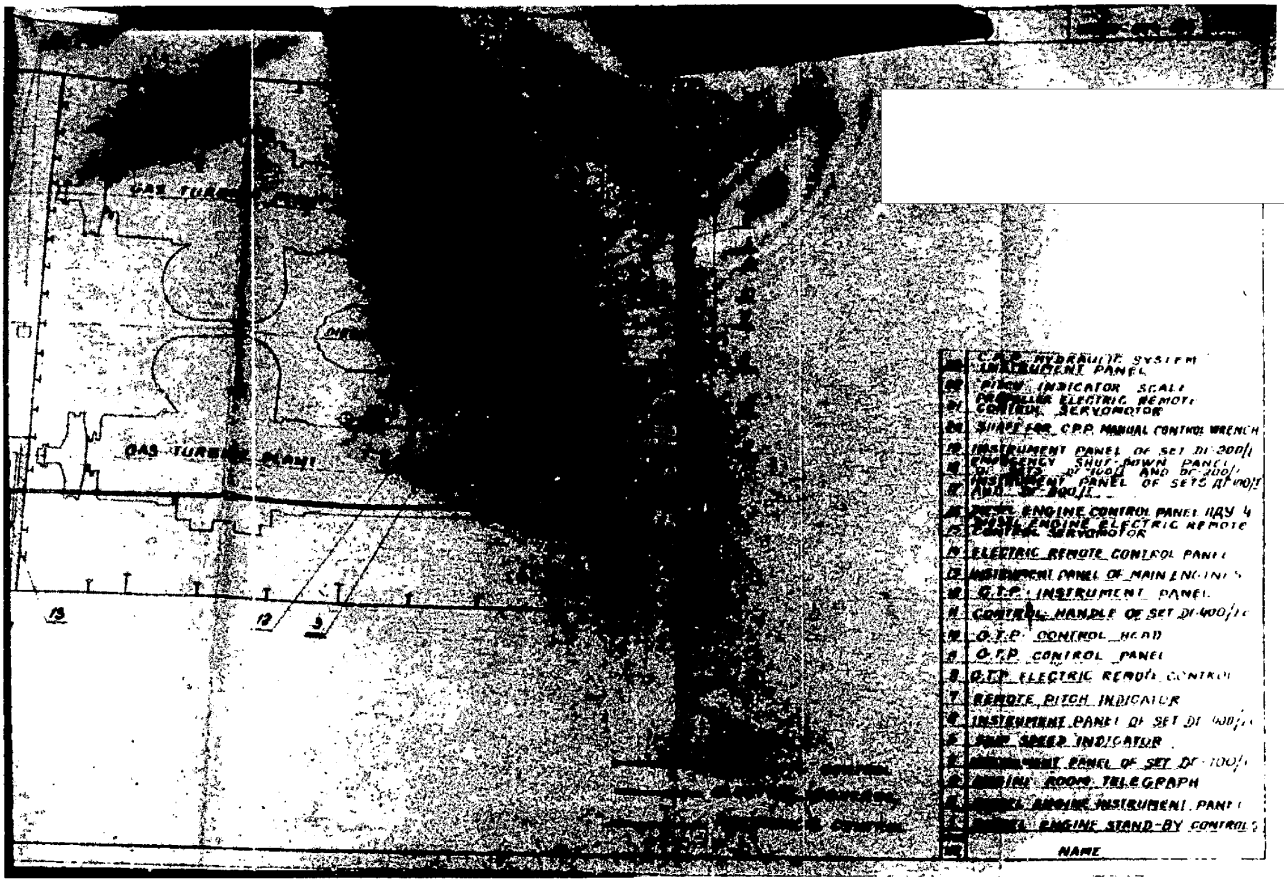

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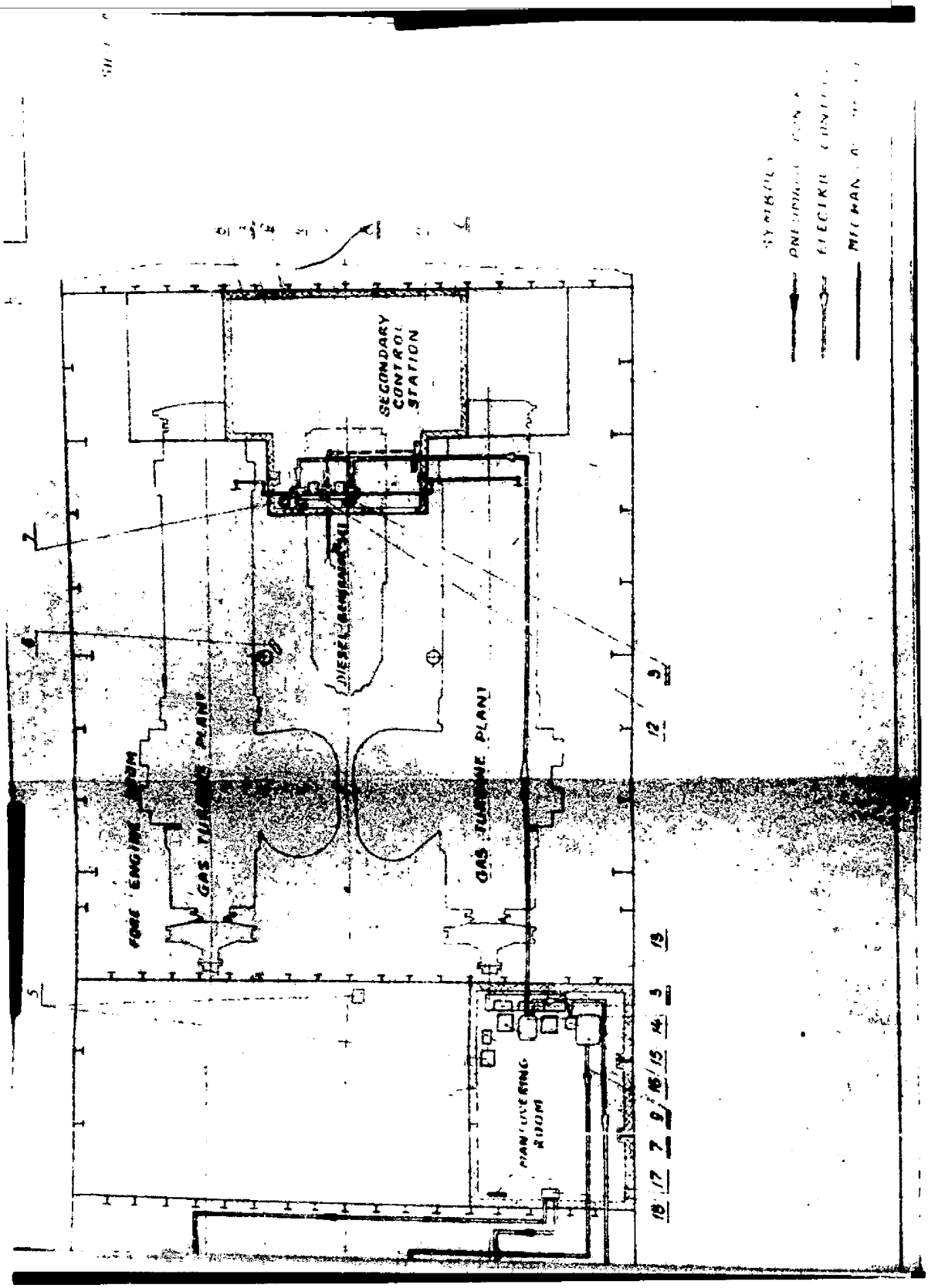

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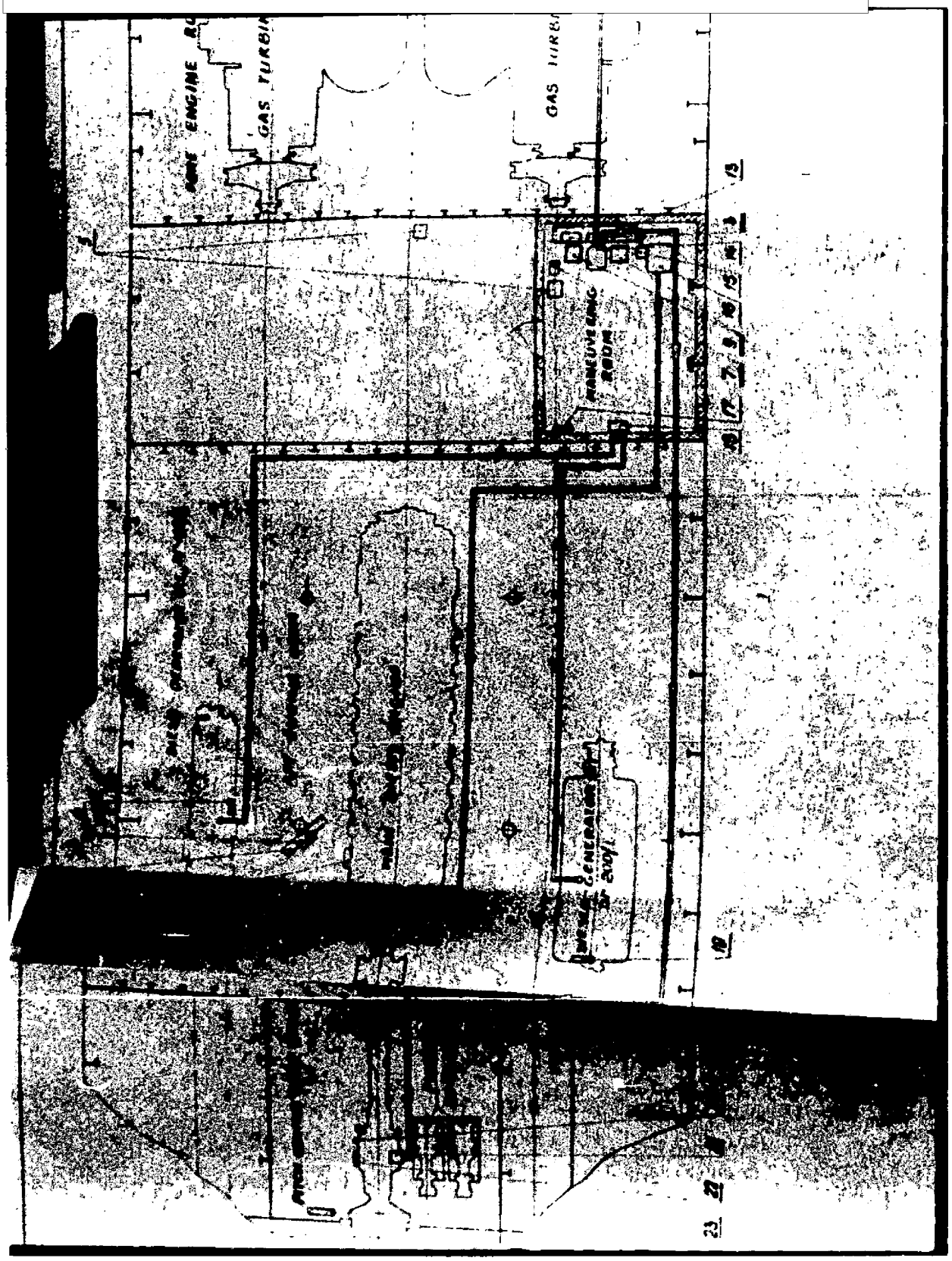

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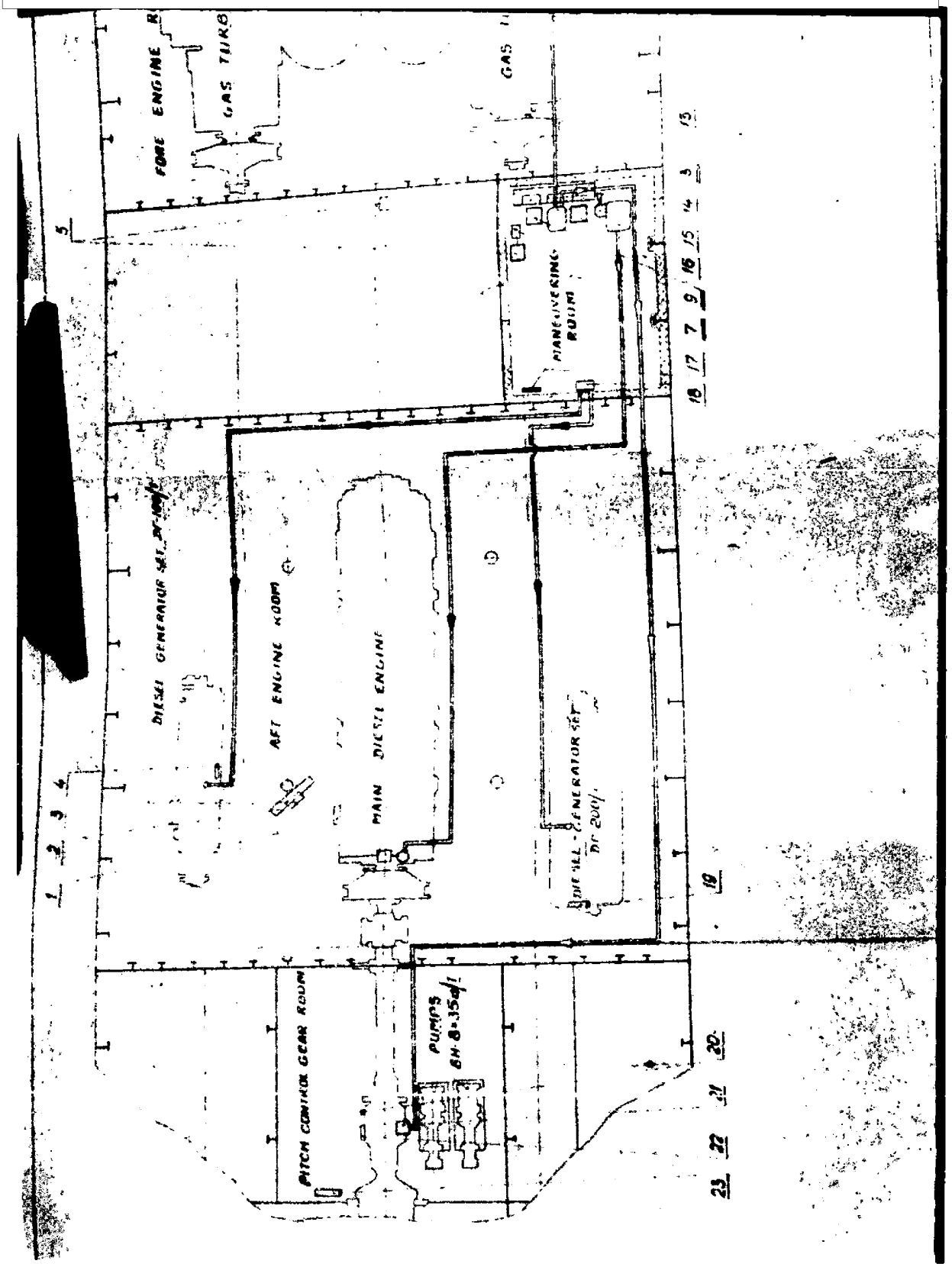

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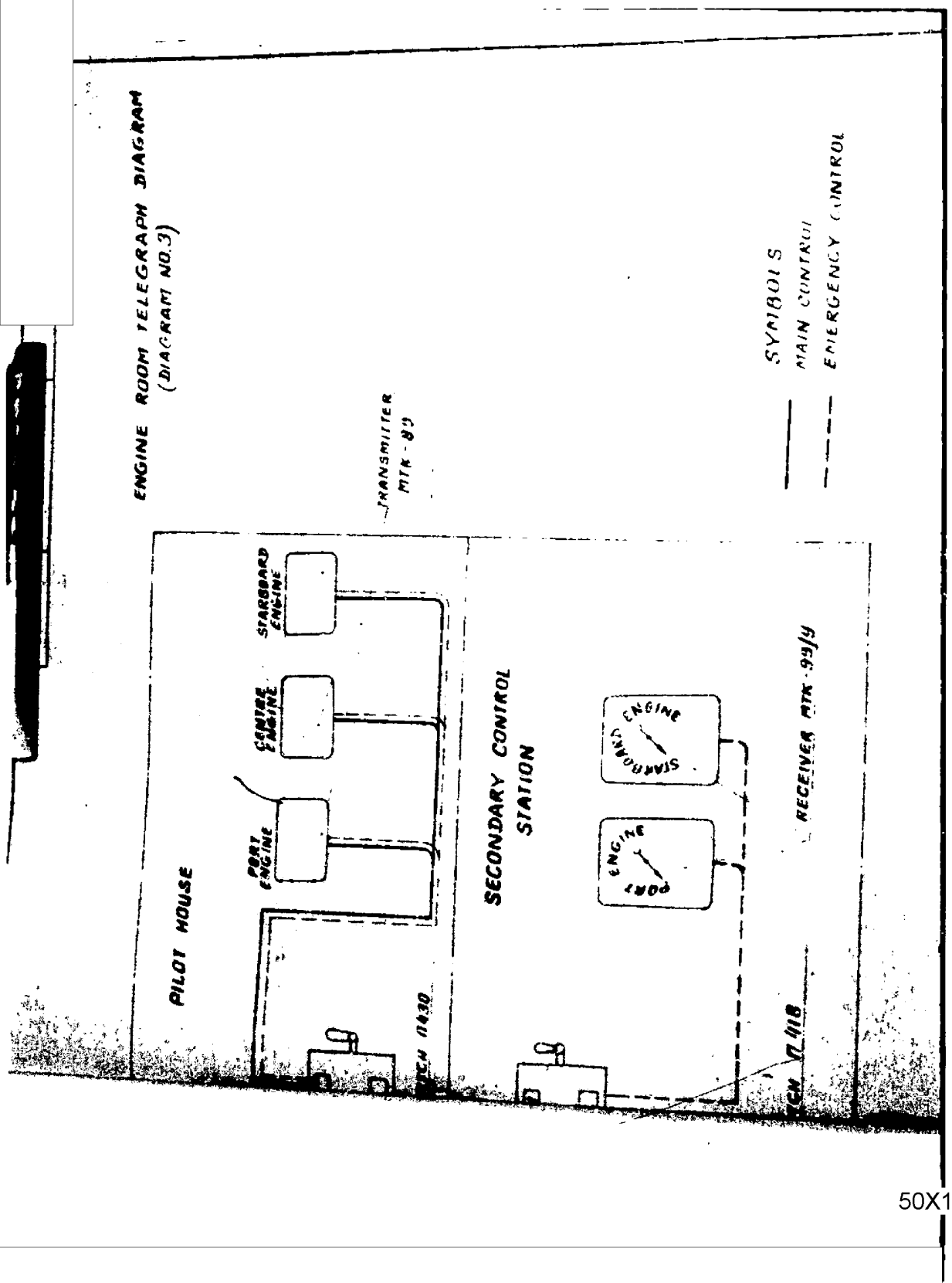

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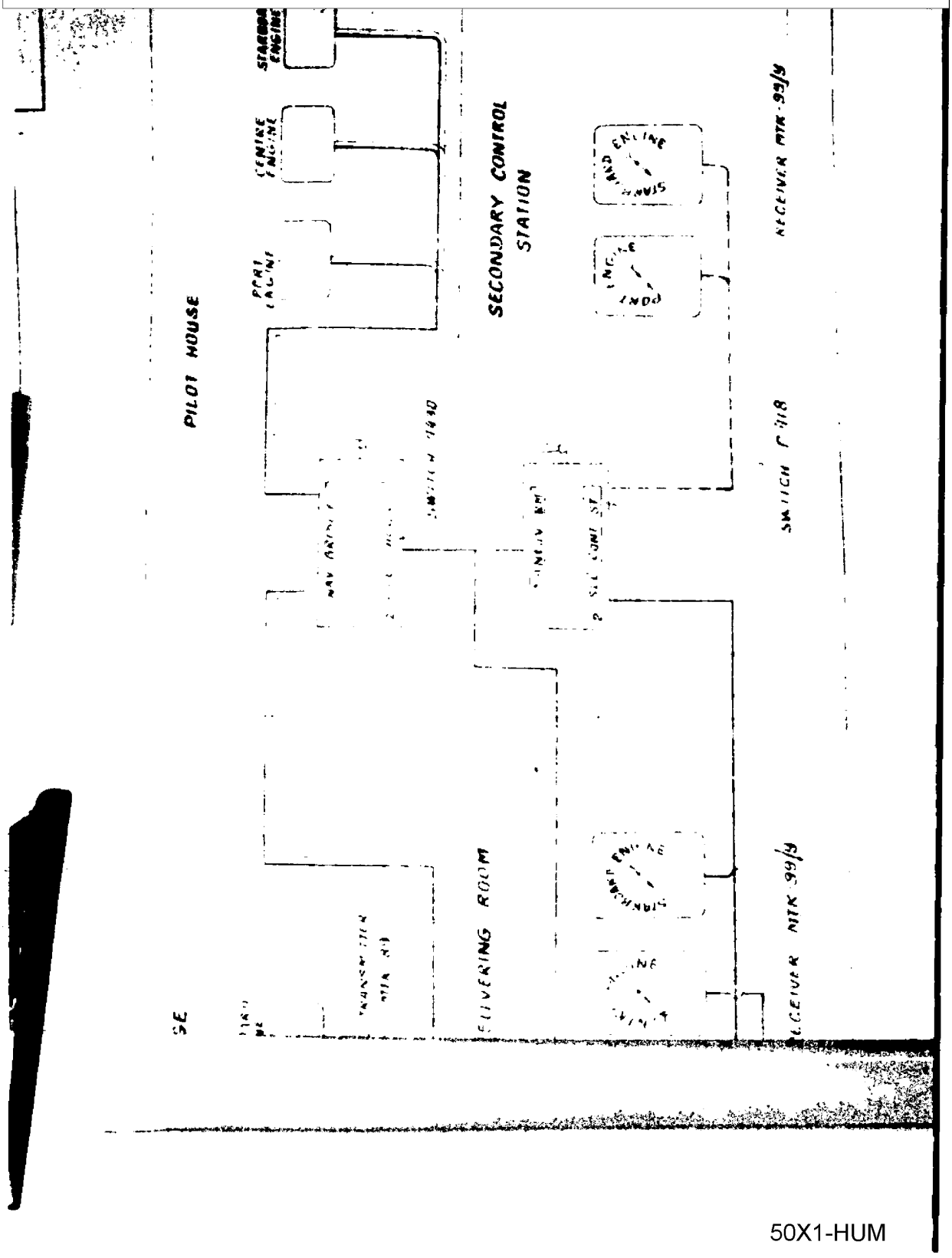

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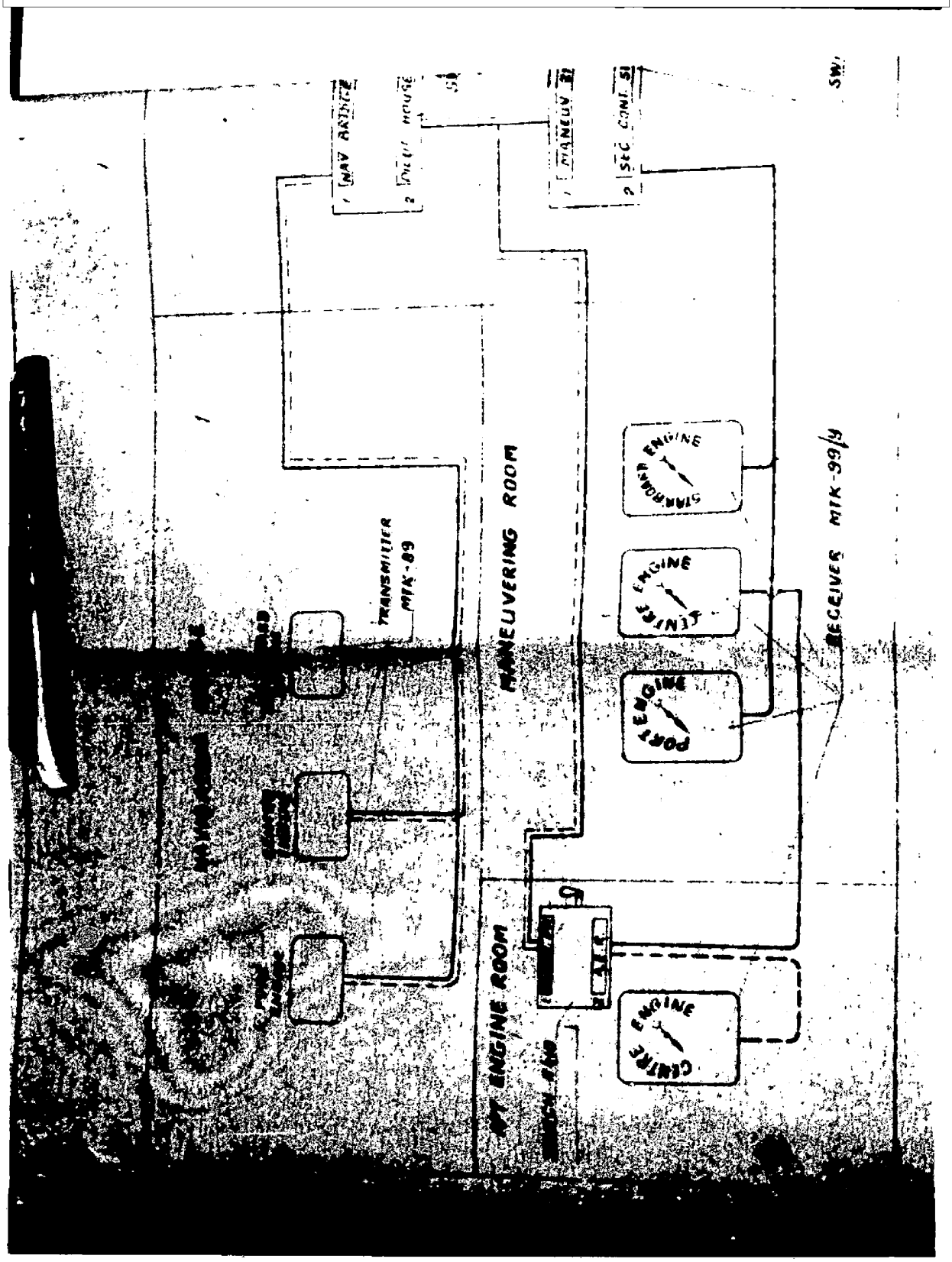

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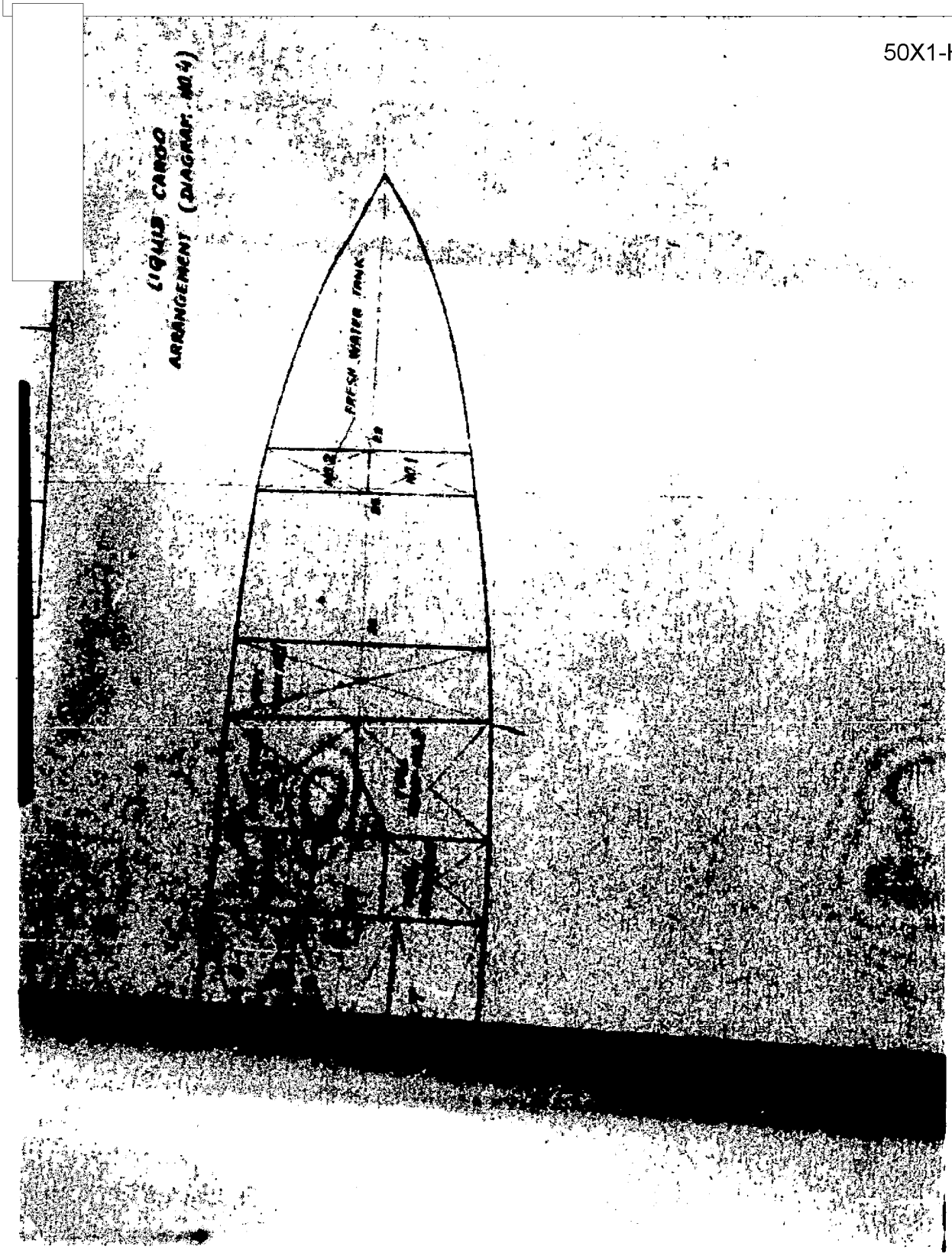

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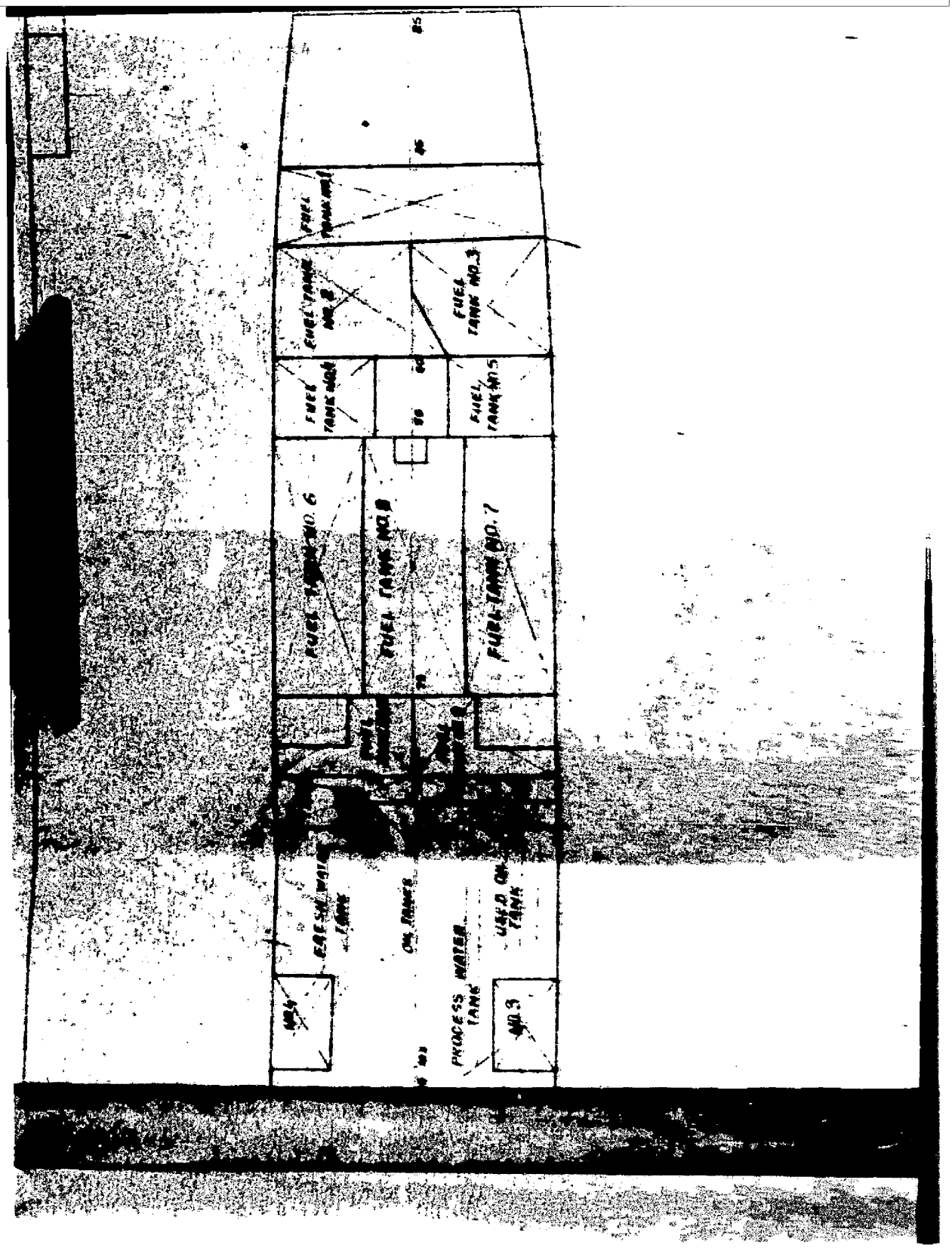

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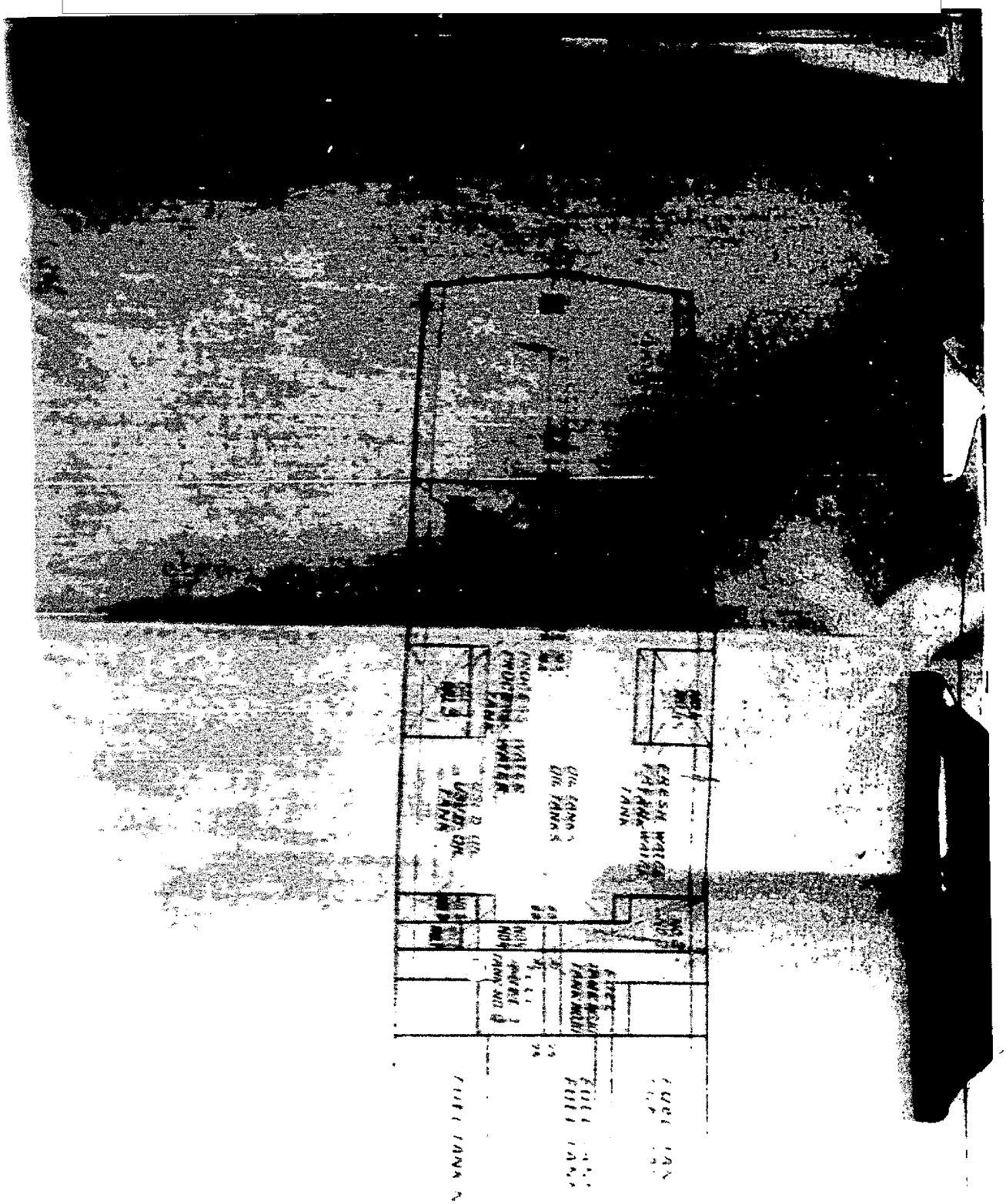

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24. A special "latch" limiting the movement of the centre handle is provided at the position corresponding to "Astern half speed" as per central scale of the electric remote control panel. The "latch" is intended to prevent overload of the main diesel engine when reversing from any one of the speeds ahead to "Astern full speed".

When reversing from "Diesel engine ahead top speed" to "Astern full speed", retain the centre handle at the "latch" until the pointer of the remote pitch indicator passes the "Stop" position. After that move off the "latch" and shift the handle to the "Astern full speed" position.

CAUTION! NORMALLY THE "LATCH" SHALL BE IN THE MOVE-
-IN POSITION

NOTE: When the ship is going astern on the main engine and the side shaft lines are freely turning, lubrication of the reducers of the gas turbine plants and the thrust bearings of the side shaft lines should be furnished by the self-contained oil pump sets

25. Reversal within the range from "Astern full speed" to "Diesel engine ahead top speed" should be effected by shifting quickly the centre handle on the panel to the preset position.

26. If the main diesel engine gets overloaded, decrease the pitch of the controllable pitch propeller using the correction handwheel provided on the electric remote control panel. When doing this, watch the remote pitch indicator scale for pitch change.

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